

CLAIMS:

1. A module for engagement with an internal assembly and an external assembly of a fiber optic connector, comprising:

a housing including a first end and a second end and at least one passageway extending from the first end to the second end;

an optical fiber extending through the passageway,

wherein the first end of the housing mates with the internal assembly;

wherein the second end of the housing mates with the external assembly, and

the housing being detachable from the internal assembly and the external assembly such that the module can be replaced by another module.

2. The module of claim 1, wherein the housing comprises:

an internal portion including a first end and a second end;

an external portion including a first end and a second end; and

an intermediate portion including a first end and a second end, wherein the first end of the internal portion abuts the second end of the intermediate portion and the second end of the external portion abuts the first end of the intermediate portion, and wherein the passageway extends from the first end of the external portion to the second end of the internal portion.

3. The module of claim 1, further comprising a spacer having first and second ends positioned within the passageway, the optical fiber extending through the spacer.

4. The module of claim 2, wherein the internal portion and the intermediate portion are configured as a single piece for receiving a spacer having first and second ends, the spacer also configured to attach to the external portion for joining the external portion to the single piece intermediate and internal portions.

5. The module of claim 3, further comprising an external ferrule positioned at least partially within the spacer proximate the first end thereof and an internal ferrule positioned at least partially within the spacer proximate the second end thereof, the optical fiber extending within the internal ferrule and within the external ferrule.

6. The module of claim 1, further comprising one or more shutters mounted on the housing.

7. The module of claim 6, wherein the shutter comprises a thumb latch.
8. The module of claim 2, wherein the internal portion, the external portion and the intermediate portion are bonded together.
9. The module of claim 8 wherein the internal portion, the external portion and the intermediate portion are bonded through welding.
10. The module of claim 8, wherein the internal portion, the external portion and the intermediate portion are bonded with adhesive.
11. The module of claim 2, wherein the external portion comprises an end wall, the intermediate portion comprises a first flange and a second flange; and the internal portion comprises an end wall; and wherein the end wall of the external portion mates with the first flange of the intermediate portion and wherein the end wall of the internal portion mates with the second flange of the intermediate portion.
12. A module as defined in claim 11, wherein a perimeter of the end wall of the internal portion and a perimeter of the second flange are smaller than a perimeter of the first flange and a perimeter of the end wall of the external portion.
13. A module for engagement with an internal assembly and an external assembly of a fiber optic connector and for transferring optical signals between the internal assembly and the external assembly, comprising:
 - an internal portion comprising at least one passageway, wherein the internal portion mates with the internal assembly of the fiber optic connector;
 - an external portion comprising at least one passageway, wherein the external portion mates with the external assembly of the fiber optic connector;
 - an intermediate portion comprising at least one intermediate passageway wherein the intermediate portion mates with the interior portion and the exterior portion; the passageway of the interior portion being in communication with the intermediate passageway and the intermediate passageway being in communication with the passageway of the external portion; and
 - an optical fiber mounted within the intermediate passageway.

14. The module of claim 13, further comprising a spacer comprising a passageway therethrough and having first and second ends, wherein the spacer is positioned within the intermediate passageway and the optical fiber extends from the first end to the second end of the spacer.

15. The module of claim 13, wherein the external portion comprises an end wall, the intermediate portion comprises a first flange and a second flange; and the internal portion comprises an end wall; and wherein the end wall of the external portion mates with the first flange of the intermediate portion and wherein the end wall of the internal portion mates with the second flange of the intermediate portion.

16. The module of claim 13 wherein the internal portion, the external portion and the intermediate portion are bonded together.

17. The module of claim 13, wherein the external portion further comprises a shutter.

18. The module of claim 13, further comprising an external ferrule having a passageway therethrough and positioned proximate the first end of the spacer and an internal ferrule having a passageway therethrough and positioned proximate the second end of the spacer, the optical fiber extending the passage way of the external ferrule and in the passageway of the internal ferrule.

19. The module of claim 18, wherein the external ferrule and the internal ferrule are bonded with the spacer.

20. The module of claim 18, further comprising:
an internal sleeve positioned around a portion of the internal ferrule and partially positioned within the passageway of the internal portion; and
an external sleeve positioned around a portion of the external ferrule and partially positioned within the passageway of the external portion.

21. The module of claim 18, wherein the external ferrule, the internal ferrule and the spacer float within the intermediate passageway.

22. The module of claim 21, wherein the end wall of the external portion and the first flange of the intermediate portion further include at least one mounting aperture.

23. The module of claim 15, wherein a perimeter of the end wall of internal portion and a perimeter of the second flange are smaller than a perimeter of the first flange and a perimeter of the end wall of the external portion.

24. The module of claim 17, wherein the shutter includes a thumb latch for opening the shutter.

25. The module of claim 24, wherein:
the internal portion includes at least two passageways;
the external portion includes at least two passageways,
the intermediate portion includes at least two passageways; and
the shutter covers the end of the at least two passageways of the external portion.

26. A method of engaging an internal assembly and an external assembly of a fiber optic connector with a module comprising the steps of:

providing a mounting panel having an interior side and an exterior side and an aperture therethrough, the internal assembly of the fiber optic connector positioned on the interior side of the mounting panel and the external assembly of the fiber optic connector positioned on the exterior side of the mounting panel;

providing a module comprising a housing having a first end and a second end and at least one passageway extending from the first end to the second end;

passing the first end of the module through the mounting panel aperture;

engaging the first end of the housing with the internal assembly;

attaching the module to the mounting panel; and

engaging the second end of the housing with the external assembly

wherein the first end of the housing is pulled through the aperture, to the exterior side of the mounting panel for engagement and disengagement of the internal assembly of the fiber optic connector and the module.

27. The method of claim 26, wherein the housing of the module comprises a flange and wherein a perimeter of the flange is larger than a perimeter of the aperture through the mounting panel and further including the steps of:

providing at least one mounting aperture through the flange; and
wherein the step of attaching the module to the mounting panel comprises the step of passing a fastener through the mounting aperture.

28. The method of claim 26, wherein the housing of the module further includes a shutter proximate the second end of the housing, and wherein the shutter is placed in an open position prior to engaging the second end of the housing with the external assembly of the fiber optic connector.

29. A fiber optic module assembly comprising:
an internal assembly;
an external assembly;
a module having first and second ends and at least one passageway extending from the first end to the second end, wherein the first end of the housing mates with the internal assembly and the second end of the housing mates with the external assembly;
an optical fiber positioned within the at least one passageway; and
wherein the housing is detachable from the internal assembly and the external assembly such that the module can be replaced by another module.

30. The fiber optic module assembly of claim 29, wherein the module further comprises:

an internal portion having first and second ends;
an external portion having first and second ends; and
an intermediate portion having first and second ends, wherein said first end of the intermediate portion mates with the second end of the external portion and the second end of the intermediate portion mates with the first end of the internal portion.

31. The module assembly of claim 30, wherein the internal portion includes an end wall at its first end, the external portion includes an end wall at its second end and the intermediate portion includes a first flange at its first end and a second flange at its second end and wherein a perimeter of end wall of the external portion and a perimeter of the first

flange of the intermediate portion are larger than a perimeter of the end wall of the internal portion.

32. A shutter for attachment to a fiber optic module, the fiber optic module comprising a plurality of passageways, wherein said shutter covers the plurality of passageways.

33. The shutter of claim 32, further including a thumb latch for rotating the shutter.